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War-winning technology provided by AFRL's Sensors Directorate

by Grace Janiszewski, Sensors Directorate

WRIGHT-PATTERSON AIR FORCE BASE, Ohio — The Air Force Research Laboratory met with the Secretary of the Air Force Jan. 22 to report that they had met a short suspense to increase the efficiency of one of the warfighter's tools.

Master Sgt. David Coates (left) and Lt. Col Don Kessler, both from the Sensors Directorate, field test their new KeCo antenna switch prior last month. (Courtesy photos)

Lt. Col. Donald Kessler and Master Sgt. David Coates of AFRL's Sensors Directorate delivered approximately 100 field prototypes of the life-saving KeCo switch to Air Force Special Operations Command last month in response to Dr. James G. Roche's direction.

Now forward deployed troops have one less task to do, thanks to Kessler and Coates. The two were asked by the720th Special Tactics Group at Hurlburt Field, Fla., to create a lightweight, durable switch enabling ground-to-ground, as well as, ground-to-satellite communications with the existing radio equipment in October. By the end of the year, they had produced two field-ready prototypes, called the "Kessler-Coates" switch or "KeCo."

"My background with Security Forces gave me insight into combat operations," said Coates. "We needed a user-friendly switch that could be easily used with gloves or in the dark."

The Special Ops folks are extremely pleased with the outcome. "This was an ingenious and intuitive solution to a potentially dangerous problem," said an Air Force Combat Controller assigned to the 720th STG.

"I can carry in excess of 100 pounds of equipment when dropped into a forward deployed location; that doesn't include food or water," he continued.

"When radios are made for Special Operations," Coates said, "they must be lightweight and use as little power as possible. Our switch was designed to be perfectly tuned and in doing so, we achieved amazing efficiency." Unfortunately, as radios were upgraded in recent years, they fell short an antenna port, necessitating manual switching of cables between the ground-to-ground, and ground-to- satellite capabilities. In live fire situations, this could put the troops at extreme risk.

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http://extra.afrl.af.mil/news/index.htm

AFRL facility scheduled for July completion

by Fran Crumb, Information Directorate

ROME, N.Y. — Work under the auspices of Atkins Benham Constructors of Oklahoma City, Okla., has the $19.6 million Air Force Research Laboratory's Information Directorate research facility on track for a July completion at the Griffiss Business & Technology Park.

The new 105,000-square-foot facility is the centerpiece of a unique, $24.8 million partnership between the Air Force and New York State. Congressionally-approved, it is the result of joint funding and support by the Air Force Military Construction Program and the state's Empire State Development Corp.

The Naval Facilities Engineering Command, Philadelphia, Pa., is responsible for administering the construction.

The new construction, combined with on-going renovation in the adjacent Building 3, will result in an improved work environment and state-of-the-art laboratory facilities for the technical mission at the Information Directorate. It is expected to house more than 300 government employees and contractors, and allow for the closure of a three-building complex located at the intersection of Hill and Brooks Roads.

The Rome Research Site's Technical Library will be moved from its current location in Building 106 to the new facility. AFRL security personnel will also transfer to the new facility from their current location in Building 302. Nearly all of the site's scientists and engineers will be housed in the new facility and Building 3.

Completion of the Information Directorate Research Facility will conclude a two-phase consolidation program. The first phase of the program was completed two years ago, with the demolition of approximately 200,000 square feet of space in the east wing and "headhouse," or front portion, of Building 2 on Brooks Road. The west wing of the building, a sprawling World War II era warehouse, was remodeled and occupied by directorate support offices as a result of the 1993 Base Realignment and Closure Commission (BRACC) decision on the former Griffiss Air Force Base.

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Find additional Fe@tures on the web

Engineers protect building occupation from blasts using spray-on coating

Directorate honors top military personnel

Air Force breaks ground on $15.5M facility

Edwards historic rocket test stand rededicated

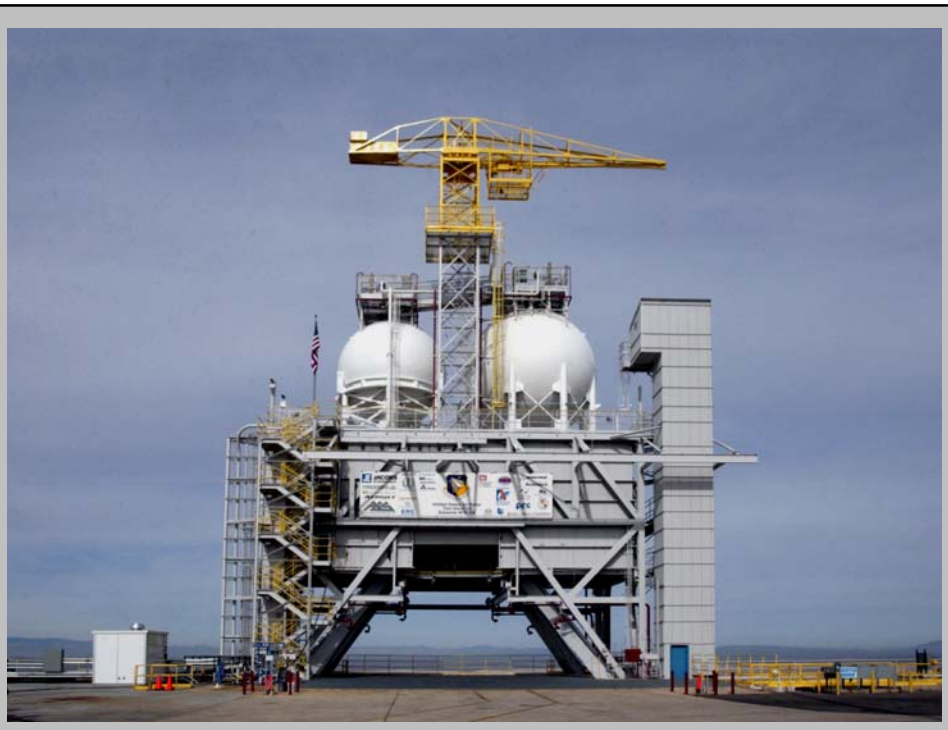
by Ranney Adams, Propulsion Directorate

EDWARDS AIR FORCE BASE, Calif. — One of the Air Force Research Laboratory's largest and most historic rocket test stands at Edwards Air Force Base was rededicated with a ribbon cutting on Jan. 31.

The 15 story-high Test Stand 1-D, overlooking the dry lakebed at Edwards, towered over the crowd of attendees. Dignitaries, engineers, technicians and suppliers gathered along with rocket industry leaders from Aerojet and Boeing Rocketdyne to mark the completion of the 1-1/2 year modernization effort.

"This is something we've been waiting on for a long time. This facility represents history," said Col. Joe Boyle, Site Commander. "And now it is ready for the future."

The liquid oxygen and kerosene-based test stand is now considered state-of–the-art and capable of testing rocket engines and components with millions of pounds of thrust. Originally built as an Apollo era F-1 rocket engine test facility, it was taken from storage in the desert climate and modernized to increase national rocket engine test and research capabilities. The modernization cost was approximately $12 million. Estimates to build a new test stand from scratch were in the neighborhood of $500 million.



EDWARDS AIR FORCE BASE, Calif. — Located at Edwards Research Site, Test Stand 1-D is part of facilities that have provided the nation with rocket propulsion research, development and test capabilities for almost 50 years (Air Force photo).

The foresight and support of California's state and federal legislative officials, with the assistance of the California Space Authority and others, helped enable the funding of the project for the Air Force according to Sverdrup Technology, the prime contractor, and their management-consulting firm, Booz Allen Hamilton.

The test stand's capabilities fits into the overall DoD national rocket propulsion program called Integrated High Payoff Rocket Propulsion Technology (IHPRPT) that is coordinated by AFRL. The program's future rocket propulsion demonstrations can now utilize the stand's massive thrust capabilities. IHPRPT's DoD/NASA/and industry partnership is working towards a national doubling of propulsion capability. That means more thrust, fewer parts, improved manufacturing and innovative materials application. IHPRPT encompasses liquid rocket engine, solid rocket motor, and advanced propulsion technologies.

The stand is part of the laboratory's nearly $3 billion worth of facilities at Edwards. Giving the nation rocket propulsion research, development and test capabilities for over 50 years, nearly every American rocket can trace its research and testing to this facility. @

KeCo Switch (from page 1)

The application of this technology may be quite broad, according to Kessler. Many Special Forces use the same communications equipment. It is not unreasonable to think that within a few years that there could be thousands of these switches in use."I've been a ham radio operator for years, so in looking at the problem, the answer nearly jumped out at me," said Kessler. "This was not rocket science."

Kessler was fortunate to have found a partner of Coates' vast experience. "I knew in our first conversation that this guy had the ability to deliver. He was named project manager immediately."

Coates has also impressed the AFSOC leadership. To date, he has been tasked with resolving four other "low-level" needs.

"I guess you could say that he is AFRL's Special Operations 'go-to guy,'" joked Kessler.

"We set out to change the way AFRL does business, and literally presented a solution to a dangerous problem, and we did it in three months. I usually see the beeps and squeaks of technology that won't be in weapons systems for years. This was a great collaborative effort creating safer equipment for the warfighter in weeks rather than years," said Kessler. @

AFRL developing technology to help military law enforcement see through walls

by Fran Crumb, Information Directorate

ROME, N.Y. — Engineers at the Air Force Research Laboratory's Information Directorate are pursuing technologies that will allow military peacekeepers and civilian law enforcement personnel to monitor individuals concealed in buildings.

The directorate recently awarded a $2,993,158 contract to Time Domain Corp. of Huntsville, Ala., to produce a portable device capable of detecting human motion behind a wall. The 12-month contract is funded by the Army Night Vision Laboratory at Fort Belvoir, Va., in support of its Enhanced Through the-Wall Surveillance for Military Operations in Urbanized Terrain (MOUT) Program.

"We will be getting a portable device weighing about eight pounds," said Bernard J. Clarke, program manager in the directorate's Information and Intelligence Exploitation Division. "The device, about 14-by-22-by-6 inches and worn on the arm, will detect motion on the other side of a wall using extremely low-power radar."

"Our experience in developing radar technology led to this cooperative work with the Army," Clarke said. "This specific technology detects a 'Doppler shift' in the returned signal to locate movement. If people are not moving, it will not detect them."

The portable size of the unit will allow for use by special forces. It is envisioned for use in urban areas, where military personnel will be tasked to enter buildings for searching and clearing. The technology also has major potential applications for civilian law enforcement agencies, where SWAT or hostage-rescue teams need to determine if someone is on the other side of a wall.

The directorate is also pursuing several other technology/phenomenology areas for sensing, with funding from the National Institute of Justice, a division of the Department of Justice.

"We are looking at three or four additional technologies for this purpose," said Clarke. "The technologies we are using to see through walls are the same as we are using for detecting concealed weapons."

Through-the-Wall Surveillance (TWS) research uses a variety of existing sensor technologies and then combines, or fuses, specific data from each for a better image.

The directorate's TWS technical program has included a variety of radar frequencies, including ground-penetrating, millimeter waves and FM radar. Also considered were applications of acoustic signals and image processing.

Time Domain's portable sensor, scheduled for delivery by next fall, will be capable of detecting the movement of a human body up to thirty feet behind a standard interior wall. The thickness and composition of exterior walls will degrade that capability. @

DE's Airborne Laser demonstrates refueling ability

KIRTLAND AIR FORCE BASE, N.M. — The Airborne Laser, the world's first attack laser aircraft, demonstrates its ability to refuel in the air during a recent test over California. The air-to-air refueling system was installed during a two-year-long modification process at the Boeing facility in Wichita, Kan., which started the conversion of the assembly line 747-400 freighter into a directed energy weapon system. The aircraft now is at Edwards Air Force Base, Calif., where its lasers and optical systems will be installed. (Air Force photo) @

AFMC people building upon the centennial legacy

by Gen. Lester L. Lyles, Commander, Air Force Materiel Command

WRIGHT-PATTERSON AIR FORCE BASE, Ohio — As we begin our year-long celebration of the 100th anniversary of powered flight, I am amazed by the tremendous advances in technology we've made in such a seemingly short time.

Since the Wright Brothers' first flight and the development of the aircraft as a weapon system, the United States has become the most powerful country the world has known. Our technological edge has made airpower a decisive factor in every military engagement since World War II.

Providing increased capabilities to America's warfighters to maintain that edge is the heart and soul of our mission in Air Force Materiel Command, and I could not be more proud of the way the men and women of this command have achieved that mission this past year.

AFMC people are building upon the centennial legacy every day by developing, acquiring and sustaining the most advanced air and space technologies and systems to give our warfighters the capabilities they need to accomplish their missions and return home safely.

We developed and fielded a Wind Corrected Munitions Dispenser, which so dramatically increased the accuracy of cluster bombs dropped by B-52 bombers that the venerable aircraft could be used for close air support for the first time in its 50-year history.

AFMC people increased the Air Force's capability by arming the Predator unmanned aerial vehicle with the Hellfire missile. This powerful weapon system provides near real-time video to decision makers to identify targets, engage the targets and accomplish battle damage assessment quickly and accurately.

Our people tested and delivered the Global Hawk unmanned aerial vehicle to the warfighters engaged in Operation Enduring Freedom, even though the high-tech UAV is still in the engineering, manufacturing and development phase of acquisition.

Men and women in our depots implemented a program called, "Lean," to cut costs, overtime and repair time throughout depot maintenance processes. In many cases, they've cut repair cycle time and put aircraft back into the hands of the operational commands sooner for use in the war on terrorism.

Their work on the KC-135 tankers is a prime example. Workers reduced that aircraft's depot repair days from 400 in the year 2000 to 225 in 2002. Putting that into perspective, what took a little more than a year to do a couple of years ago now takes about seven months - putting systems back into the warfighter's hands is what AFMC is all about.

AFMC people are completely dedicated to supporting the warfighter. We are taking a hard look at everything we do to determine how we can transform to improve that support.

We're using programs such as divestiture to get rid of activities or tasks that are no longer needed, and spiral development to provide increased capabilities to warfighters when they need it most - today!

We're working to ensure we have the right people with the right experience in the right jobs through workforce shaping. We're using an approach called Enterprise Leadership to make all of our systems work with each other.

We're bringing the warfighter into the development and testing phases of our weapon systems to ensure we're providing the capabilities they need. The bottom line - AFMC is developing an expeditionary mindset, becoming more efficient and responsive - easier for the warfighter to do business with!

The men and women of AFMC have done an outstanding job this past year, and I am extremely proud and yet humbled to serve with you! As heirs to the Wright Brothers' legacy, AFMC people are continuing today to deliver Proactive Rapid Integrated Dominant Effects to America's warfighters! @

AFRL awards $2.8M contract to enhance cybersecurity

by Fran Crumb, Information Directorate

ROME, N.Y. — Providing advanced cybersecurity technologies and tools to both the military and law enforcement is the goal of a $2,843,462 contract awarded by the Air Force Research Laboratory (AFRL) Information Directorate to Dolphin Technology Inc. of the Griffiss Business & Technology Park, Rome.

The 18-month agreement, "Cybersecurity Collaborating with Information Technology via the Cyber Science Laboratory," is part of a $4 million congressional funding action to the Department of Justice's National Institute of Justice (NIJ).

"The objective of this research will be to identify and develop information assurance technologies to meet current and projected needs to counter cyberthreats," said Chester J. Maciag, program manager in the directorate's Defensive Information Warfare Branch. "The work will be performed in the Cyber Science Laboratory of the NIJ's National Law Enforcement and Corrections Technology Center here at Rome."

"Dolphin Technology and its subcontractors will also implement an effective process for transferring information assurance technologies to the military and law enforcement community," said Maciag. "The Cyber Science Laboratory has a charter for training, education and outreach to law enforcement in the areas of cyber security and cyber terrorism."

"Part of the AFRL contract will deal with a reassessment of the cyber threat — both the inside threat from users with authorized access to a network and the outside threat from hackers," explained Fred J. Demma, Dolphin vice president for special programs.

"There will be special emphasis on identity theft, which is a major problem today for an ever-growing number of citizens," said Demma. "Another technology spin-off to the public will be enterprise protection planning, which will provide an overall cyber awareness plan to minimize threats to business and academic networks." Dolphin will also oversee development of a model for the transition of computer forensic tools — with special emphasis on identity theft awareness — to law enforcement at the state and local level. @

Net Index

Due to the number of submissions we receive, some sections of *news@afrl* are available exclusively on-line. The on-line version of the newsletter allows users to view the AFRL corporate calendar, news releases generated by AFRL headquarters, operating instructions, L@b L@urels and Roundups sections.

The L@b L@urels section of the electronic newsletter is dedicated to members of Air Force Research Laboratory who receive awards and honors. The Roundups section of the electronic newsletter keeps Air Force Research laboratory employees informed about contracts AFRL has awarded. Below is an index of articles one can find in each of these on-line sections.

L@b L@urels

- **Garscadden receives 2002 Will Allis Prize**
- **ML scientist earns Air Force Basic Research Award**
- **Directed Energy employees receive recognition**

Roundups

- **AFRL Rome awards two contracts to Buffalo firm**

To view the full text of these and other articles visit the *news@afrl* page on the Internet at http://extra.afrl.af.mil/news/index.htm.
To submit L@b L@urels or Roundups from your directorate, send a query to AFRL Public Affairs at:

Jill.Bohn@afrl.af.mil

For more on these stories see news@afrl http://extra.afrl.af.mil/news/index.htm

AFRL NEWSBRIEFS

AFRL Lt. Col. promotions named

WRIGHT-PATTERSON AIR FORCE BASE, Ohio — Those selected include LAF (Line of the Air Force) — Terence S. Andre (HE), David T. Beckwith (DE), Robert Bolha (XP), Benjamin B. Brown (XP), James N. Ceney (VA), Thomas J. Connare, (XP), Kevin L. Craig (SN), John C. Delbarga (DE), James A. Fellows (ML), David S. Hidinger (DE), Michael L. Talber (IF), Peter J. Hughes (VA), James A. Rothenflue (PR), Daniel J. Staggenborg (SN), Juan R. Vasquez (AFOSR), Michael J. Walker (DE); JAG — Timothy A. Hicks (AFOSR); BSC — Lee D. Shibley (HE). @

New CMSgt announced

WRIGHT-PATTERSON AIR FORCE BASE, Ohio — Connie LaPage from the Human Effectivness Directorate has been promoted to the rank of Chief Master Sergaent. @

Air Vehicles Team recognized by AFOSR

WRIGHT-PATTERSON AIR FORCE BASE, Ohio — Air Vehicles Directorate's Control Science Center of Excellence research team, led by Dr. Silva Banda, has been selected as an AFOSR Star Team for the years 2003—2005.

This award indicated the international stature of the team members' research contributions and reflects the team's leadership in science and technology transition.@